

**5 CLAIMS****WHAT IS CLAIMED IS:**

1. An isolated nucleic acid molecule comprising a polynucleotide having a nucleotide sequence at least 96.7% identical to a sequence selected from the group consisting of:
  - 10 (a) a polynucleotide fragment of SEQ ID NO:3 or a polynucleotide fragment of the cDNA sequence included in ATCC Deposit No: PTA-2966, which is hybridizable to SEQ ID NO:3;
  - (b) a polynucleotide encoding a polypeptide fragment of SEQ ID NO:4 or a polypeptide fragment encoded by the cDNA sequence included in ATCC Deposit No:  
15 PTA-2966, which is hybridizable to SEQ ID NO:3;
  - (c) a polynucleotide encoding a polypeptide domain of SEQ ID NO:4 or a polypeptide domain encoded by the cDNA sequence included in ATCC Deposit No: PTA-2966, which is hybridizable to SEQ ID NO:3;
  - (d) a polynucleotide encoding a polypeptide epitope of SEQ ID NO:4 or a  
20 polypeptide epitope encoded by the cDNA sequence included in ATCC Deposit No: PTA-2966, which is hybridizable to SEQ ID NO:3;
  - (e) a polynucleotide encoding a polypeptide of SEQ ID NO:4 or the cDNA sequence included in ATCC Deposit No: PTA-2966, which is hybridizable to SEQ ID NO:3, having glycine receptor activity;
  - 25 (f) a polynucleotide which is a variant of SEQ ID NO:3;
  - (g) a polynucleotide which is an allelic variant of SEQ ID NO:3;
  - (h) an isolated polynucleotide comprising nucleotides 4 to 1293 of SEQ ID NO:3, wherein said nucleotides encode a polypeptide corresponding to amino acids 2 to 431 of SEQ ID NO:4 minus the start codon;
  - 30 (i) an isolated polynucleotide comprising nucleotides 1 to 1293 of SEQ ID NO:3, wherein said nucleotides encode a polypeptide corresponding to amino acids 1 to 431 of SEQ ID NO:4 including the start codon;
  - (j) a polynucleotide which represents the complementary sequence (antisense) of SEQ ID NO:3; and
  - 35 (k) a polynucleotide capable of hybridizing under stringent conditions to any one of the polynucleotides specified in (a)-(j), wherein said polynucleotide

5 does not hybridize under stringent conditions to a nucleic acid molecule having a nucleotide sequence of only A residues or of only T residues.

2. The isolated nucleic acid molecule of claim 1, wherein the polynucleotide fragment comprises a nucleotide sequence encoding a human glycine receptor protein.

10 3. A recombinant vector comprising the isolated nucleic acid molecule of claim 1.

4. A recombinant host cell comprising the vector sequences of claim 3.

5. An isolated polypeptide comprising an amino acid sequence at least 96.2% identical to a sequence selected from the group consisting of:

15 (a) a polypeptide fragment of SEQ ID NO:4 or the encoded sequence included in ATCC Deposit No: PTA-2966;

(b) a polypeptide fragment of SEQ ID NO:4 or the encoded sequence included in ATCC Deposit No: PTA-2966, having glycine receptor activity;

20 (c) a polypeptide domain of SEQ ID NO:4 or the encoded sequence included in ATCC Deposit No: PTA-2966;

(d) a polypeptide epitope of SEQ ID NO:4 or the encoded sequence included in ATCC Deposit No: PTA-2966;

(e) a full length protein of SEQ ID NO:4 or the encoded sequence included in ATCC Deposit No: PTA-2966;

25 (f) a variant of SEQ ID NO:4;

(g) an allelic variant of SEQ ID NO:4;

(h) a species homologue of SEQ ID NO:4;

30 (i) a polypeptide comprising amino acids 2 to 431 of SEQ ID NO:4, wherein said amino acids 2 to 431 comprise a polypeptide of SEQ ID NO:4 minus the start methionine;

(j) a polypeptide comprising amino acids 1 to 431 of SEQ ID NO:4;

(k) a polypeptide encoded by the cDNA contained in ATCC Deposit No. PTA-2966; and

(l) a polypeptide comprising the polypeptide sequence of SEQ ID NO:74;

- 5           6.       The isolated polypeptide of claim 5, wherein the full length protein comprises sequential amino acid deletions from either the C-terminus or the N-terminus.
7.       An isolated antibody that binds specifically to the isolated polypeptide of claim 5.
- 10           8.       A recombinant host cell that expresses the isolated polypeptide of claim 5.
9.       A method of making an isolated polypeptide comprising:  
              (a) culturing the recombinant host cell of claim 8 under conditions such that said polypeptide is expressed; and
- 15           (b) recovering said polypeptide.
10.       The polypeptide produced by claim 9.
11.       A method for preventing, treating, or ameliorating a medical condition, comprising the step of administering to a mammalian subject a therapeutically effective amount of the polypeptide of claim 5 or the polynucleotide of claim 1.
- 20           12.       A method of diagnosing a pathological condition or a susceptibility to a pathological condition in a subject comprising:  
              (a) determining the presence or absence of a mutation in the polynucleotide of claim 1; and
- (b) diagnosing a pathological condition or a susceptibility to a pathological
- 25           condition based on the presence or absence of said mutation.
13.       A method of diagnosing a pathological condition or a susceptibility to a pathological condition in a subject comprising:  
              (a) determining the presence or amount of expression of the polypeptide of claim 5 in a biological sample; and
- 30           (b) diagnosing a pathological condition or a susceptibility to a pathological condition based on the presence or amount of expression of the polypeptide.
14.       An isolated nucleic acid molecule consisting of a polynucleotide having a nucleotide sequence selected from the group consisting of:
- 35           (a) a polynucleotide encoding a polypeptide of SEQ ID NO:2;

5 (b) an isolated polynucleotide consisting of nucleotides 4 to 1251 of SEQ ID NO:1, wherein said nucleotides encode a polypeptide corresponding to amino acids 2 to 417 of SEQ ID NO:2 minus the start codon;

(c) an isolated polynucleotide consisting of nucleotides 1 to 1251 of SEQ ID NO:1, wherein said nucleotides encode a polypeptide corresponding to amino  
10 acids 1 to 417 of SEQ ID NO:2 including the start codon;

(d) a polynucleotide which represents the complimentary sequence (antisense) of SEQ ID NO:2;

(e) a polynucleotide encoding a polypeptide of SEQ ID NO:4;

(f) an isolated polynucleotide consisting of nucleotides 4 to 1293 of  
15 SEQ ID NO:3, wherein said nucleotides encode a polypeptide corresponding to amino acids 2 to 431 of SEQ ID NO:4 minus the start codon;

(g) an isolated polynucleotide consisting of nucleotides 1 to 1293 of SEQ ID NO:3, wherein said nucleotides encode a polypeptide corresponding to amino acids 1 to 431 of SEQ ID NO:2 including the start codon;

20 (h) a polynucleotide encoding the HGRAsv polypeptide encoded by the cDNA clone contained in ATCC Deposit No. PTA-2966; and

(i) a polynucleotide which represents the complimentary sequence (antisense) of SEQ ID NO:4.

25 15. The isolated nucleic acid molecule of claim 14, wherein the polynucleotide comprises a nucleotide sequence encoding a human glycine receptor protein.

16. A recombinant vector comprising the isolated nucleic acid molecule of claim 14.

30 17. A recombinant host cell comprising the recombinant vector of claim 16.

18. An isolated polypeptide consisting of an amino acid sequence selected from the group consisting of:

(a) a polypeptide fragment of SEQ ID NO:2 having glycine receptor activity;

35 (b) a polypeptide domain of SEQ ID NO:2 having glycine receptor activity;

- 5 (c) a full length protein of SEQ ID NO:2;
- (d) a polypeptide corresponding to amino acids 2 to 417 of SEQ ID NO:2, wherein said amino acids 2 to 417 comprise a polypeptide of SEQ ID NO:2 minus the start methionine;
- (e) a polypeptide corresponding to amino acids 1 to 417 of SEQ ID NO:2;
- 10 (f) a polypeptide fragment of SEQ ID NO:4 having glycine receptor activity;
- (g) a polypeptide domain of SEQ ID NO:4 having glycine receptor activity;
- (h) a full length protein of SEQ ID NO:4;
- 15 (i) a polypeptide corresponding to amino acids 2 to 431 of SEQ ID NO:4, wherein said amino acids 2 to 431 comprise a polypeptide of SEQ ID NO:4 minus the start methionine;
- (j) a polypeptide corresponding to amino acids 1 to 431 of SEQ ID NO:4; and
- 20 (k) a polypeptide encoded by the cDNA contained in ATCC Deposit No. PTA-2966.
19. The method for preventing, treating, or ameliorating a medical condition of claim 11, wherein the medical condition is a disorder selected from the group consisting of: neural disorder, a neural disorder related to aberrant excitotoxic cell death, a neural disorder related to chronic peripheral neuropathies, a gastrointestinal disorder, a gastrointestinal disorder related to aberrant longitudinal muscle/myenteric plexus contractions, irritable bowel syndrome, a disorder related to hyper glycine receptor activity.
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